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SECTION 321

ASPHALT CONCRETE PAVEMENT

321.8 PLACEMENT is changed to add:

321.8.6 Preservative Seal A surface treatment per Section 334 shall be required on streets other than arterial. The surface treatment shall be Tire Rubber Modified Surface Seal (TRMSS) and shall be applied immediately prior to the end of the construction warranty period.

SECTION 334

PRESERVATIVE SEAL FOR ASPHALT CONCRETE

334.1 GENERAL is changed to read:

The asphalt concrete preservative seal shall be composed of a penetrating softening agent and sealant to rejuvenate and preserve, or a Tire Rubber Modified Surface Seal (TRMSS) to preserve, the asphalt concrete pavement.

334.3 CONSTRUCTION METHOD is changed to read:

All application rates specified in Section 718 shall be diluted 50:50 preservative and water, except as recommended by the manufacturer for Type D and E.

SECTION 336

PAVEMENT MATCHING AND SURFACING REPLACEMENT

336.1 DESCRIPTION: is changed to read:

Asphalt concrete pavement replacement shall be constructed in accordance with Type 'A' 'T-Top' of Detail 200, with a minimum shelf depth of 16 inches, as indicated on the plans, and as required by Sections 321 and 710.

Asphalt concrete shall be EVAC mix.

This item shall include the installation of pavement marking and reflective pavement markers to restore the surface to the condition prior to construction.

336.5 PAYMENT: is changed to add:

There will be no additional payment for the installation of pavement marking and reflective pavement markers.

*SECTION 340

CONCRETE CURB, GUTTER, SIDEWALK, SIDEWALK RAMPS, DRIVEWAY, AND ALLEY ENTRANCE

340.2.1 Detectable Warnings is changed to add:

Refer to the *List of Approved Products* for approved detectable warning systems.

340.3 CONSTRUCTION METHODS is changed:

The last sentence of the second paragraph of this section shall read (applies to expansive soils only):

The subgrade shall then be compacted to relative density of 80% minimum to 90% maximum at a moisture content within 3% of optimum.

SECTION 360

TELECOMMUNICATIONS INSTALLATION

360.3 CABLE INSTALLATION:

(A) Trunk Lines (2), Second Sentence is changed to read:

The cable shall be placed within a steel casing at a minimum depth of 48 inches.

(B) Telecommunications cables other than "trunk lines" depth of placement is changed according to the following schedule:

Location	Depth of Placement
Arterial Street	48 Inches
Collector Street or Industrial Area	36 Inches
All Others	36 Inches

SECTION 401

TRAFFIC CONTROL

401.4 TRAFFIC CONTROL MEASURES is changed to add:

At areas where striping obliteration has occurred, the roadway surface shall be sealed with a slurry seal product approved by the City. Refer to the *List of Approved Products*. The product shall be thoroughly mixed with #30 mesh sand conforming to Section 701 at a rate of two pounds per gallon prior to application. Application shall be made on the area of striping obliteration by means of a squeegee.

Striping obliteration by grinding is not permitted.

SECTION 450

GUIDED BORE CONSTRUCTION

450.1 DESCRIPTION:

This work shall consist of installing a conduit by guided bore.

450.2 CONSTRUCTION:

Prior to construction, the contractor shall submit for approval a location plan and profile of the work in accordance with COC Detail C-112.

Only approved slurry boring methods shall be allowed. Water jetting shall not be substituted for slurry boring. All pneumatic boring shall be at a minimum depth of 36 inches below pavement surface.

Uncased guided bore holes shall be at a depth below finish grade no less than four times the diameter of the hole. Uncased guided bore holes shall be limited to a maximum of 12 inches. Bore holes in excess of 12 inches in diameter shall be cased, unless otherwise approved by the Engineer. Contractor shall stipulate the size of bore on the permit application.

Over drilling or final reaming of uncased guided bores should be limited to no more than one inch over the maximum cross section of the conduit bank, casing, or pipe. Annular spaces exceeding this requirement shall be pressure grouted.

Guided bore methods shall minimize over-reaming or over-drilling of holes. Fluids shall not cause scour of the bore hole beyond the previously noted tolerance. Controlled fluid boring is preferred and should utilize fluids to remove cuttings, stabilize and lubricate bore holes, soften soils for advancing bores, provide directional control of guided bores, and for cooling of drilling equipment. Uncontrolled jetting, where the primary purpose is to use fluid pressure to erode soil for creation of the final bore hole diameter, is prohibited. Methods which vary from these requirements shall require demonstration and shall have a history of successful use prior to acceptance. Any method utilized shall not disturb the soils outside the final bore hole diameter.

Unless site specific soil information is available indicating otherwise, caving of soils around bore holes should be assumed. Pipe, case, or conduit banks should be advanced during final reaming.

Guided bores through unstable granular soils and granular utility backfill should be stabilized with a pressurized bentonite slurry drilling fluid having a consistency of at least one pound of bentonite to five gallons of water, or an approved equal. The flow rate and applied pressure shall be monitored. A sudden loss of pressure indicates that slurry may be intruding excessively into the backfill. Cased bores may be used in lieu of stabilization.

SECTION 450

Equipment operators shall observe the bore hole and monitor cuttings for excessive soil removal. When evidence of excessive voids are found, bore holes shall be pressure grouted after placement of pipe, casing, or conduit banks.

*SECTION 601

TRENCH EXCAVATION, BACKFILLING, AND COMPACTION

601.2.9 Shoring and Sheeting: is changed to add:

When vertical side walls are to be excavated and trench boxes are not used, the contractor shall do such trench bracing, sheathing, or shoring necessary to perform and protect the excavation as required for safety and conformance to governing laws. Shoring, sheeting, or other protective procedures reviewed by the Engineer or his designee for conformance to standards shall be required when the trench depth exceeds five feet. The contractor shall provide a shoring and bracing plan designed by his engineer for review for adherence to OSHA requirements. Spacing of shoring braces shall not exceed ten feet center to center.

601.2.10 Open Trench: the third paragraph is changed to add:

Steel plates shall be installed in accordance with Std Dtl 211. Where the steel plates are restrained by temporary asphalt, they may be required to be spot-welded together for any period of time that the contractor is not present to adjust for their longitudinal movement due to traffic.

601.4.3: Backfill: the first paragraph is changed to read:

Backfill under street pavement shall be half-sack CLSM per Section 728 and be constructed per Detail 200 with 16" minimum depth of ABC shelf, 'T-Top' pavement replacement unless otherwise stated on the construction plans or special provisions. Pavement matching and surface replacement shall be in accordance with Section 336.

*SECTION 610

WATERLINE CONSTRUCTION

610.3 MATERIALS: is changed to read:

Pipe shall be ductile iron pipe in accordance with Section 750 or polyvinyl chloride (PVC) in accordance with COC Supplement Section 751 - PVC Pressure Pipe.

610.4 CONSTRUCTION METHODS: is changed to add:

All pipe shall be bedded in accordance with COC Detail C-308 and installed in accordance with the latest revision of AWWA C600.

Polyvinyl Chloride pipe shall be installed in accordance with the AWWA Manual 23.

For all pipe materials, locator wire and marking tape shall be installed in accordance with COC Detail C-408.

610.7 VALVES: is changed to read:

All gate valves shall conform to the latest revisions of AWWA C509 or C515 standards.

Gate valves for buried service shall be the non-rising stem (NRS) type.

Direction of opening shall be counterclockwise (Open Left).

The body and bonnet of the valves shall be constructed of ductile-iron per ASTM A536.

The marking "D.I." or "Ductile Iron" shall be cast in raised letters on the valve.

Valve body, bonnet, and stuffing box shall be coated and lined with fusion-bonded epoxy conforming to the AWWA C550 standard.

Valve stem diameters and minimum turns to open shall conform to Table 7 in AWWA C509-09 and AWWA C515-09.

The NRS-type valve stems shall be made of bronze or stainless steels. Bronze stems shall use copper alloys that contain less than 6% zinc and 6% aluminum. Stainless steel stems shall contain not less than 15% chromium and be from the 300 or 400 alloy series.

NRS stems must have a thrust collar that is integral with the stem in accordance with section 4.4.5.3 of AWWA C515-09. Thrust collars that are non-integral with the stem are not acceptable.

Valve wedge must be completely encapsulated with EPDM rubber, symmetrical in design, and seat equally well with flow in either direction.

*SECTION 610

Gate valves four inches and larger shall be equipped with male-type wedge guides and polymer guide covers. Wedges employing female-type designs are not acceptable.

All gaskets shall be pressure-energized type such as O-rings.

The top two stem O-rings must be replaceable while fully open and while subject to full rated working pressure. O-rings set in cartridges are not allowed.

Valves shall be equipped with stainless steel bolting that meets the requirements of ASTM F593 Standard Specifications for Stainless Steel bolts, Type 304, Alloy group 1, CW condition, and ASTM F594 Standard Specification for Stainless Steel Nuts, Type 304, Alloy group 1, CW Condition.

Bolt head and nuts shall be hexagonal shaped with dimensions conforming to ANSI B18.2.1. Metric sized and recessed socket head bolts, are not allowed.

Operating nuts shall be 2 inches square.

Valves shall be NSF Certified to Standard 61.

All valves 2 inches to 48 inches:

Valves may be used in either the horizontal or vertical positions.

Valve gearing shall be in accordance with Table 9 of AWWA C515-09 or C509-09 Standard.

610.11 METER SERVICE CONNECTIONS: is changed to add:

(E) Service taps shall be installed using an all bronze double-strap tapping saddle or a tapped tee. Any tapping saddle for use on PVC pipe shall provide full support around the circumference of the pipe and a bearing area for 2 inches minimum along the axis of the pipe.

610.15 TESTING: is changed to add:

The Contractor shall test water lines for water tightness, including all fittings and connections to the water lines. Each pipe shall be tested for leakage and pressure in accordance with applicable provisions of AWWA standards and/or Manuals, except as modified below.

The Contractor shall provide all vents, piping, plugs, bulkheads, valves, bracing, blocking, pump, including measuring devices and all other equipment necessary for making the tests, and including necessary pressure gauges.

*SECTION 610

The pipe shall be tested between each valve or between a valve and the closed end of the pipe. Pipe test sections shall be limited to ½ linear mile or less, unless otherwise approved in writing by the Engineer.

All connections, blow-offs, hydrants and valves shall be tested with the main, where practical.

The test section shall be slowly filled with potable water and all air shall be vented from the line. The rate of filling shall be as approved by the Off-site Inspector, with at least 24 hour notice required before filling is scheduled.

(A) Pressure Tests: is changed to add:

Water lines, including all fittings and connections, shall be tested for water tightness by subjecting each test section to a pressure test. The test pressure shall be measured at the lowest end of the test section. The test pressure shall be 188 psi unless otherwise specified. The duration of each pressure test shall be at least 2 hours.

The pressure test shall begin after the pipe has been filled with water for at least 24 hours to allow for absorption.

(B) Leakage Tests: is changed to read:

Leakage tests shall be made after the pressure test has been completed, pressure test results are satisfactory, and all backfilling and compaction is completed.

The duration of each leakage test shall be at least 2 hours. Leakage test pressure shall be at least 150 psi and not vary more than 5 psi during the test.

The maximum allowable leakage from the pipe line shall be determined by the applicable formula:

$$L = ND\frac{\sqrt{P}}{7400}$$

in which:

L = allowable leakage in gallons per hour

N = number of joints in the pipe line being tested, with no allowance for joints at branches, blow-offs, fittings, and similar appurtenances. "N" is calculated using the standard length of pipe installed divided into the length being tested.

D = nominal inside diameter of pipe in inches

P = average test pressure, in psi gage, as measured at the lowest point in the test section.

Should the test on any section of the pipe line show leakage greater than that specified above, the Contractor shall locate and correct the deficiency and retest until the leakage is within the specified allowance for a 2 hour duration. All repairs and retests shall be the contractor's responsibility and expense.

Leakage is defined as the quantity of make-up water necessary for the test section to maintain the specified leakage test pressure after the pipe line has been filled with water and all air expelled.

SECTION 615

SEWER LINE CONSTRUCTION

615.1 DESCRIPTION: is modified to add:

Polypropylene pipe shall conform to Section 739.

615.4 LAYING PIPE: is changed to read:

HDPE, polypropylene, and PVC pipe and fittings shall be installed in accordance with ASTM D-2321.

Pipe bedding for polypropylene pipe shall be ABC in accordance with Section 701.

615.6.2 Water Stops is changed to read:

Water stops will be required when connecting HDPE and polypropylene pipe to concrete structures, manholes, etc.

615.7 SANITARY SEWER SERVICE TAPS: is modified to add:

Sanitary sewer service taps for polypropylene pipe shall be made utilizing standard manufacturer fittings.

615.10 BACKFILLING: is modified to add:

Backfilling and compaction shall be in accordance with Section 601 and ASTM D2321 for polypropylene pipe.

615.11 TESTING (C) is changed to read:

(C) Deflection Test for HDPE, Polypropylene, and PVC Pipe

In addition to the tests prescribed above, the Contractor shall perform a deflection test on the system as directed by the Engineer. Any part of the installation which shows deflection in excess of 5% of the nominal inside diameter per Section 738 for HDPE pipe, or in excess of 5% of the minimum inside diameter per ASTM F-2736 or F-2764 for polypropylene pipe, or in excess of 5% of the average inside diameter per ASTM D-3034 for PVC pipe, shall be corrected.

SECTION 616

RECLAIMED WATERLINE CONSTRUCTION

616.2 MATERIALS: is changed to read:

Valve boxes shall be in accordance with Section 345, this Section, Detail 391 and COC Detail C-406.

616.3 INSTALLATION: is changed to add:

Pipe will be bedded in accordance with COC Detail C-308 and identified in accordance with C-408.

SECTION 618

STORM DRAIN CONSTRUCTION

618.1 DESCRIPTION: is changed to read:

This section covers concrete, polypropylene and high density polyethylene (HDPE) pipeline construction used for the conveyance of irrigation water and storm drainage in streets, easements, and alley rights-of-way, under low hydrostatic heads.

618.2 MATERIALS: is changed to read:

Polypropylene pipe and fittings shall be in accordance with COC Supplement Section 739 - Polypropylene pipe & Fittings for Storm Drain and Sanitary Sewer.

Pipe bedding for polypropylene pipe shall be ABC in accordance with Section 701.

618.3 CONSTRUCTION METHODS: is changed to add:

Water stops will be required when connecting HDPE and polypropylene pipe to concrete structures, manholes, etc.

Lateral service taps for polypropylene pipe shall be made utilizing standard manufacturer fittings.

Backfilling and compaction shall be in accordance with Section 601 and ASTM D2321 for polypropylene pipe.

SECTION 625

MANHOLE CONSTRUCTION AND DROP SEWER CONNECTIONS

625.3 CONSTRUCTION METHODS is changed to add:

Manholes constructed as a separate project or permit from subsequent surface improvements shall be constructed with a minimum of 12" and a maximum of 24" of reinforced concrete adjusting rings. All other project manholes shall conform to Detail 420.

Manholes constructed in arterial streets or serving sewer lines 18" in diameter or greater shall be coated with a corrosion-protective coating applied in accordance with the manufacturer's specification. Refer to the City of Chandler *List of Approved Products* for allowable corrosion-protective coating products.

All manholes shall be coated with an latex insecticide coating applied in accordance with the manufacturer's recommendations. Refer to the City of Chandler *List of Approved Products* for allowable insecticide coating products. The coating shall be applied in accordance with US Environmental Protection Agency recommendations starting from the top of the bench to a level eight feet above.

SECTION 630

TAPPING SLEEVES, VALVES AND VALVE BOXES ON WATERLINES

630.2 GENERAL: is changed to add:

Potable water valve boxes shall conform to Detail 391, Type 'C', deep skirted lid type and COC Detail C-307.

Reclaimed water valve boxes shall conform to Detail 391, Type 'C', deep skirted lid type with a square surface box and COC Detail C-406.

630.3 GATE VALVES: is changed to add:

The connecting ends of valves may be flange, mechanical joint, push-on, or an appropriate combination. Valves which require transition gaskets to ductile iron pipe sizes may be furnished only in sizes 4 inches through 8 inches.

630.4.2 Tapping Sleeves Subsection (A) (2) (a) is changed:

Following the word Cast Iron, add

(Not allowed for use on PVC pipe).

SECTION 718

PRESERVATIVE SEAL FOR ASPHALTIC CONCRETE

718.1 GENERAL is changed to add:

Type E - Tire Rubber Modified Surface Seal (TRMSS) consisting of a clay-stabilized cationic asphalt emulsion of asphalt cements modified with terminal-blended, digested ground scrap tire rubber. Applies at 0.1 to 0.2 gallons per square yard, undiluted.

718.2 TEST METHODS AND REQUIREMENTS is changed to add:
Type E TRMSS preservative seal shall meet the requirements of Table 718-2 by certification from the manufacturer.

TABLE 718-2

Treated Base Asphalt Characteristics (prior to emulsification)		
Test Property	**Test Procedure**	**Requirement**
Tire Rubber Content, %		10% minimum
Flash Point, °F	ASTM D 93	> 550°F
Softening Point, °F	ASTM D 36	> 130°F
Penetration, 77°F, dmm	ASTM D 5	12 to 30 dmm
Solubility, %	ASTM D 2042	> 98.5%

Emulsion Characteristics		
Test Property	**Test Procedure**	**Requirement**
Uniformity	ASTM D 2939.05	PASS Product shall be homogenous and show no separation or coagulation that cannot be overcome by moderate stirring.
Viscosity, Kreb Unit	ASTM D 562	35 to 85 KU
Specific Gravity	ASTM D2939.07	< 1.04
Residue by Evaporation	ASTM D 2939.08	> 33%
Residue Softening Point, °F	ASTM D 36	> 250°F Sample evaporated within Softening Point Ring in conformance to ASTM D 2939.08 at 190 to 200°F.

SECTION 718

Performance Based Characteristics

A ceramic tile panel shall be incorporated in place of the metal panels. The ceramic tile panel preparation shall be in accordance with Test Methods D 2939-25.1.1 guidelines.

Test Property	**Test Procedure**	**Requirement**
Resistance to Heat	ASTM D 2939.14	PASS No sagging or slippage of film beyond the initial reference line after 212°F exposure for 2 hrs.
Resistance to Water	ASTM D 2939.15	PASS No blistering or re-emulsification after 24 hr submersion in water.
Wet Flow	ASTM D 2939.19	PASS No flow beyond initial reference line.
Direct Flame Test	ASTM D 2939.20	PASS No continued combustion or slippage and run-down.
Wet Film Continuity	ASTM D 2939.22	PASS A uniformly homogenous consistency.
Resistance to Kerosene	ASTM D 2939.25	PASS Report any evidence of leakage of kerosene, loss of adhesion and discoloration of tile.
Wet Track Abrasion Test	ISSA (TB-100)	< 2% Calculated weight loss, percentage of original volume.
Accelerated Weathering Test	ASTM G 154 1000 hrs UVA-340 lamp, 0.77 W/m^2 (v1.0 calibration), 8 hrs UV light at 50°C, 5 min spray, 3:55 hrs condensation at 50°C	PASS No cracking, chipping, surface discoloration or loss of adhesion. No color fading or lightening.

SECTION 739

POLYPROPYLENE PIPE & FITTINGS FOR STORM DRAIN AND SANITARY SEWER

739.1 GENERAL:

This specification presents the requirements for polypropylene pipe utilized for gravity flow, low pressure storm drain and sanitary sewer systems.

739.2 MATERIALS:

Pipe and fittings shall be double wall, smooth interior, with annular exterior corrugations in conformance to ASTM F-2736 for pipe diameters up to and including 24". Pipe and fittings shall be triple wall, smooth interior and exterior, with annular inner corrugations in conformance to ASTM F-2764 for pipe diameters 30" to 60".

739.3 JOINTING SYSTEMS:

Pipe shall be joined with a gasketed integral bell and spigot joint. The joint shall be water-tight in accordance with ASTM D-3212. Sanitary sewer pipe shall have dual gaskets. Gaskets shall conform to ASTM F-477. They shall be installed by the pipe manufacturer and covered with a removable protective wrap to ensure the gasket is free of debris. A manufacturer-recommended joint lubricant shall be applied during assembly. The pipe bells shall be reinforced with a polymer composite band installed by the manufacturer.

739.4 FITTINGS:

Lateral pipes shall be connected to the main by manufactured fittings. Water stops in accordance with ASTM C-923 shall be installed at structures. Water stops, joint seals, field repair couplers, and connections to dissimilar pipe shall be in accordance with manufacturer's recommendations, and shall be submitted to the City for approval prior to use.

SECTION 751

POLYVINYL CHLORIDE (PVC) PRESSURE PIPE

751.1 GENERAL:

These specifications apply to Polyvinyl Chloride (PVC) pressure pipe intended for use as potable, wastewater, and reclaimed water distribution pipelines, which carry water under pressure.

751.2 WORKMANSHIP:

Pipe shall be homogeneous throughout. It shall be free of voids, cracks, inclusions, or other defects. It shall be as uniform as commercially practical in color, density, and other physical properties. Pipe surfaces shall be free from nicks and scratches. Joining surfaces of spigots and other joints shall be free from gouges and imperfections that could cause leakage. The contractor shall supply the Engineer with certified third party test data establishing both the long-term compressive strength and the long-term modulus of elasticity of the PVC material.

751.3 MATERIAL:

4 inch through 12 inch PVC pressure pipe shall be designed, manufactured and tested in accordance with AWWA C900, latest edition. The barrel of furnished pipe shall conform to the outside dimensions of steel pipe (IPS) or cast-iron-pipe-equivalent (CI), and with the wall thickness of dimension-ratio (DR) Series 14. All approved PVC pipe shall carry a NSF rating.

The pressure rating for C900 pipe shall be 200 psi minimum.

16 inch and larger PVC pressure pipe shall be designed, manufactured, and tested in accordance with AWWA C905, latest edition. The barrel of furnished pipe shall have an iron-pipe-size-equivalent (IPS) outside diameter and wall thickness equal to the dimension-ratio (DR) Series 18.

The pressure rating for C905 pipe shall be 235 psi.

All PVC pipe furnished shall be integral bell with elastomeric gaskets. Plain ends with elastomeric gasket couplings will be allowed only for intermediate pipe lengths. PVC joints using elastomeric gaskets to achieve the pressure seal shall be tested as assembled joints and shall meet the laboratory performance requirements specified in ASTM D3139.

A Manufacturer's Affidavit for compliance to AWWA C900 and AWWA C905 shall be furnished. The manufacturer shall provide documentation of the long-term compressive strength of the pipe material, or the long-term hydrostatic design strength, which shall be certified by an independent third party.

SECTION 751

All required manufacturing quality control inspection and testing shall be performed in the United States of America at the pipe manufacturer's plant or at an approved testing laboratory in the United States. The seal of the testing agency that verified the suitability of the pipe material for potable water service shall be marked on the pipe. In addition, markings on the pipe shall include the following:

Nominal size and OD base

Material code designation

Dimension ratio number

AWWA pressure class

AWWA designation number for this standard

Manufacturer's name or trademark and production record code.

Pipe shall be supplied within 270 days of its manufacture. A Manufacturer's written Verification of date of manufacture shall be provided.

751.4 APPLIED LOAD CALCULATIONS:

Assumption of soil arching shall not be used in calculation embankment loads over PVC pipe. The prism earth load formula shall be used to determine earth loads.

$$Wc = HwBc$$

Where:

Wc = Embankment Load, lbs/ft

H = Depth of soil cover, ft

w = Soil Density, lbs/ft

Bc = Pipe outside diameter, ft

751.5 BEDDING:

Pipe bedding shall be in conformance with COC Detail C-308. Bedding shall consist of ABC in conformance to Section 702.

751.6 FITTINGS:

SECTION 751

Fittings shall be ductile iron and conform to AWWA C110 or C153 for 250 psi minimum working pressure rating.

All fittings shall be cement lined in accordance with AWWA C104.

Fittings which require transition gaskets to ductile iron pipe sizes may be furnished only in sizes 6 inch through 8 inch.

PVC connections to asbestos cement or ductile iron pipe shall be ductile or gray iron adapters.

751.7 STORAGE:

Storage of PVC pipe shall be in accordance with the manufacturer's recommendation and guidelines. PVC pipe and fittings shall be stored in a dry, ventilated area that protects the pipe form UV radiation and the elements. Pipe stockpiled at the construction site shall not remain exposed to the elements and weather in excess of 24 hours, or as approved by the Engineer.

PVC pipe shall be delivered to the site and stored and handled in accordance with the manufacturer's instructions. During shipment and storage, the pipe ends shall be securely covered. PVC pipe shall be stored in a manner such that it is protected from exposure to sunlight and/or extreme heat.

751.8 THRUST BLOCKS:

Thrust blocks shall be installed per Section 610.14.

SECTION 756

DRY BARREL FIRE HYDRANTS

756.3 HYDRANTS is changed to add:

Refer to the *List of Approved Products* for fire hydrants approved for use.

An effective vandal-proof device to prevent unauthorized opening of fire hydrants shall be provided with each hydrant. Operating nuts shall be drilled and tapped per COC Detail C-304. The device shall readily attach to the existing fire hydrant housing or opening mechanism. Materials shall be strong enough to withstand acts of vandalism and weather extremes and still provide smooth hydrant operation. The device shall be unique in that only a special magnetic wrench can open or close the hydrant.

An inner barrel construction of high tensile manganese bronze shall be designed to fit over the existing fire hydrant operating nut. An outer housing constructed of stainless steel shall be installed over the inner barrel so as to swivel freely until a special key wrench is used. Attachment of the outer housing shall be by a special snap ring groove designed to withstand repeated blows by sledge hammers without shearing.

A mating collar shall be installed between the outer housing hydrant top for a weather seal and to prevent removal of the swivel housing by pry bars or other tools available to vandals. The mating collar shall extend up the sides of the swivel housing and to a height sufficient to provide added protection for the hydrant operating nut and to resist repeated blows by sledge hammers.

A special key wrench shall be constructed of an aluminum-magnesium alloy. The wrench shall incorporate a unique permanent magnet, which will engage an activator located inside the outer housing. Performance must not be affected by local environmental temperature ranges or weather conditions. The special key wrench will be the only means of opening or closing the hydrant. As an added convenience, the opposite side of the key wrench shall contain a conventional pentagon recess that will work on a standard hydrant. Refer to the *List of Approved Products* for fire hydrants locks approved for use.